

Appl. No. 09/783,604
Amendment After Final dated November 15, 2004
Reply to Office Action of July 14, 2004

REMARKS

Claims 1, 5, 7, 8, 12, 13, 16, 19, 23, 24 and 29-32 are pending in this application. For purposes of expedition, base claims 1, 5 and 13 have been amended to define the pre-stored classification rule, as shown in FIG. 6, in order to clearly define Applicants' disclosed invention relative to cited prior art and to place all claims in condition for allowance. As a result, entry of the foregoing amendments is proper under 37 C.F.R. §1.116(b) because those amendments simply respond to the issues raised in the final rejection, no new issues are raised, no further search is required, and the foregoing amendments are believed to remove the basis of the outstanding rejections and to place all claims in condition for allowance.

Claims 1, 5, 7, 8, 12, 13, 16, 19, 23, 24 and 29-32 have been rejected under 35 U.S.C. §103(a) as being unpatentable over newly applied art, Takagi et al., U.S. Patent No. 5,801,965, as modified to incorporate selected features from Matsuo, JP Patent No. 11-176899 for reasons stated on pages 2-5 of the final Office Action (Paper No. 8). In support of this rejection, the Examiner asserts that Takagi '956, as a primary reference, discloses all features of Applicants' claimed invention, except for limitations of "comparing the position information of the defects with position information of the faults and extracting defects having common position information between the defects and the faults" which are allegedly disclosed by Matsuo '899. However, the Examiner's assertions are factually incorrect. The features the Examiner alleges are not disclosed or suggested anywhere in Takagi '965 or Matsuo '899. Therefore, Applicants request the Examiner to reconsider and withdraw this rejection for reasons discussed *in seriatim* herein below.

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First of all, base claims 1, 5 and 13 have been amended to make clear the implied role of a pre-stored classification rule, as shown in FIG. 6, used to define critical and non-critical defects by referring to images of defects, position information of said defects and result of performing the electronic test (i.e, information of the electronic test) for classifying images of extracted defects. For example, base claim 1, as amended, defines a method for analyzing defects in electronic circuit patterns, comprising:

- a step for inspecting a first object to detect defects during a production process and obtaining position information of said defects;
- a step for detecting images of said defects using said position information of said defects obtained;
- a step for performing an electronic test on said first object after said production process is completed to detect faults in said first object and obtain position information of said faults;
- a step for comparing said position information of said defects with said position information of said faults and extracting defects having common position information between said defects and said faults;
- a step for classifying images of extracted defects into critical defect images and non-critical defect images based on a pre-stored classification rule which defines critical and non-critical defects by referring to images of defects, position information of said defects and results of performing the electronic test to each other;
- a step for displaying images of classified defects on a screen by discriminating between said critical defect images and said non-critical defect images;
- a step for modifying said pre-stored classification rule by correcting classification of classified defect images displayed on the screen;
- a step for inspecting a second object during the production process to detect defects and obtain information of said defects including position information and image of said defects;
- a step for classifying images of said defects detected on said second object into critical defects and non-critical defects by using a modified classification rule; and
- a step for outputting information on said classified defect images of said second object.

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Similarly, base claim 5 has been amended to define a method for analyzing defects in electronic circuit patterns comprising:

a step for inspecting a first object to detect defects during a production process and obtaining information relating to said defects on the first object including position information and detailed information, and storing information relating to said position information and detailed information of said defects;

a step for performing an electronic test on said first object after said production process is completed to detect electronic faults in said first object and obtain position information of said electronic faults and storing said position information of said electronic faults;

a step for comparing stored position information of said defects with stored position information of said electronic faults and classifying said stored position information of said defects into critical defects and non-critical defects;

a step for classifying stored detailed information of said defects into critical defects and non-critical defects under a pre-stored classification rule which defines critical and non-critical defects by referring to images of said defects, classified position information of said defects, and results of performing the electronic test to each other;

a step for modifying said pre-stored classification rule by correcting classified detailed information;

a step for inspecting a second object during the production process to detect defects and obtain position information and detailed information of said defects on the second object;

a step for classifying said detailed information of said defects on the second object into critical defects and non-critical defects using a modified classification rule; and

a step for outputting information on classified defects.

Likewise, base claim 13 has also been amended to define, *inter alia*: "a step for classifying extracted defects into critical defects and non-critical defects based on a pre-stored classification rule which defines critical and non-critical defects by referring to information of defects including position information of said defects, and results of performing the electronic test to each other."

As clearly defined in each of Applicants' base claims 1, 5 and 13, information of defects and position information of electronic faults are obtained from a first object as inspected. Defects having common position information between the defects and

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the electronic faults are extracted, classified using a pre-stored classification rule that defines as either critical defects or non-critical defects by referring to images of defects, position information of said defects and results of performing the electronic test, and then displayed. In other words, classification of defect images is conducted using at least information of an electronic test. The initially set classification rule is then modified so that images of defects on a second object can be classified using the modified classification rule before completion of the production process. As a result, criticality of different types of defects on a sample object can be accurately evaluated.

In contrast to Applicants' base claims 1, 5 and 13, Takagi '965, as Applicants' earlier work product, discloses a method and an inspection system, as shown in FIG. 1, of inspecting a product, in which defects are classified on the basis of information about the extracted defects representing the analogy of the defects. In other words, not only Takagi '965 fails to disclose any step of "comparing the position information of the defects with position information of the faults and extracting defects having common position information between the defects and the faults", as correctly identified by the Examiner, but also fails to disclose any classification scheme in which defect images are classified by using information of an electronic test.

As a secondary reference, Matsuo '899 does **not** remedy the noted deficiencies of Takagi '965 in order to arrive at Applicants' base claims 1, 5 and 13. This is because Matsuo '899 only discloses a method and system for alarming defects in the manufacturing process of a semiconductor device, as shown in FIG. 1. An alarm is issued, via an alarm display device 16, when computed defect occurring rate exceeds the specified reference.

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Matsuo '899 does not disclose Applicants' extraction of defects having common position information between the defects and the electronic faults, classification using a pre-stored classification rule that defines as either critical defects or non-critical defects by referring to images of defects, position information of said defects and results of performing the electronic test, and then displayed, and modification of the initially set classification rule so that images of defects on a second object can be classified using the modified classification rule before completion of the production process, as generally defined in Applicants' base claims 1, 5 and 13.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, the Examiner must show that the prior art reference (or references when combined) must teach or suggest all the claim limitations, and that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to modify the reference or to combine reference teachings, provided with a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 2143. In other words, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." ACS Hospital System, Inc v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). The

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Examiner must point to something in the prior art that suggests in some way a modification of a particular reference or a combination of references in order to arrive at Applicants' claimed invention. Absent such a showing, the Examiner has improperly used Applicants' disclosure as an instruction book on how to reconstruct to the prior art to arrive at Applicants' claimed invention. Furthermore, any deficiencies in the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge". See In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002).

In the present situation, Takagi '965 and Matsuo '899, whether taken individually or in combination, fail to disclose and suggest key features of Applicants' base claims 1, 5 and 13. Therefore, Applicants respectfully request that the rejection of claims 1, 5 and 13 and their respective dependents be withdrawn.

With respect to base claims 16 and 23, Applicants note that the Examiner has not addressed, and neither Takagi '965 nor Matsuo '899 discloses all features of Applicants' base claims 16 and 23, particularly, the use of different classifying means, i.e., first classifying means for classifying said position information of said defects either critical defects or non-critical defects using a first classification rule, and second classifying means for classifying said detailed information of said defects either critical defects or non-critical defects. For example, base claim 16 defines a system for analyzing defects in electronic circuit patterns comprising:

- a first memory which stores position information and detailed information of individual defects detected on a first object during a production process;

- a second memory which stores position information of electronic testing faults detected on said first object with an electronic test after said production process has been completed;

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a comparator which compares said position information of said defects stored in said first memory with said position information of electrical testing faults stored in said second memory;

first classifying means for classifying said position information of said defects either critical defects or non-critical defects using a first classification rule;

second classifying means for classifying said detailed information of said defects either critical defects or non-critical defects referring to classified position information of defects using a second classification rule;

modifying means for modifying said second classification rule by correcting classified detailed information classified by said second classification means;

a third memory for storing both position information and detailed information obtained from a second object during the production process;

third classifying means for classifying said detailed information of defects detected on said second object either critical defects or non-critical defects using a modified second classification rule; and

outputting means which outputs information of defects classified by said third classifying means.

Similarly, base claim 23 defines a system for analyzing defects in electronic circuit patterns comprising:

a first memory which stores position information and detailed information of individual defects detected on a first object during a production process;

a second memory which stores position information of electrical testing faults detected on said first object by an electronic test after said production process has been completed;

a comparator which compares said position information of said defects stored in said first memory with said position information of said electrical testing faults stored in said second memory;

first classifying means for classifying said position information of said defects either critical defects or non-critical defects by using a first classification rule;

second classifying means for classifying said detailed information of said defects either critical defects or non-critical defects referring to classified position information of said defects by using a second classification rule;

display means for displaying said defects classified by said second classifying means on a screen;

modifying means for modifying said second classification rule by correcting classified detailed information classified by said second classification means and displayed on the screen; and

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outputting means which outputs information of defects classified by said second classifying means using a modified second classification rule.

As previously discussed, neither Takagi '965 nor Matsuo '899 discloses or suggests key features of Applicants' base claims 16 and 23, including the first and second classifying means and the modifying means for performing the recited functions, for example, classifying position information of defects on a first object as critical defects or non-critical defects, and detailed information of defects on the first object as critical defects or non-critical defects, using classification rules, as well as modifying the classification rule by correcting a classified result of defect images on a screen.

Since Takagi '965 and Matsuo '899 fail to disclose, and the Examiner has failed to address key features of Applicants' base claims 16 and 23, Applicants respectfully request that the rejection of base claims 16 and 23 and their respective dependents be withdrawn.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

INTERVIEW:

In the interest of expediting prosecution of the present application, Applicants respectfully request that an Examiner interview be scheduled and conducted. In accordance with such interview request, Applicants respectfully request that the

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Examiner, after review of the present Amendment, contact the undersigned local Washington, D.C. area attorney at the local Washington, D.C. telephone number (703) 312-6600 for scheduling an Examiner interview, or alternatively, refrain from issuing a further action in the above-identified application as the undersigned attorneys will be telephoning the Examiner shortly after the filing date of this Amendment in order to schedule an Examiner interview. Applicants thank the Examiner in advance for such considerations. In the event that this Amendment, in and of itself, is sufficient to place the application in condition for allowance, no Examiner interview may be necessary.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, No. 01-2135 (Application No. 501.39619X00), and please credit any excess fees to said deposit account.

Respectfully submitted,

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